**CONVERTING CALIFORNIA'S TWO NUCLEAR PLANTS FROM OTC TO COOLING TOWERS**

## *1. How Significant is the Once-Through Cooling (OTC) Impact of California's Two Nuclear Plants?*

**The two nuclear plants each use 2.5 billion gallons per day of seawater**.[1] These two plants, 2,160 MW Diablo Canyon and 2,200 MW San Onofre Nuclear Generating Station (SONGS), accounted for nearly two-thirds of the once-through cooling water utilized by the state's combined population of coastal nuclear and natural gas-fired steam boiler plants.[2,3,4]

## *2. How Critical Are California's Two Nuclear Plants to the State's Energy Supply?*

**The two nuclear plants are used extensively.** Diablo Canyon achieved capacity factors of 75%, 86%, and 103% for 2004, 2005, and 2006, respectively. SONGS attained capacity factors of 82%, 91%, and 68% for 2004, 2005, and 2006, respectively.[5] In contrast, the 15,000 MW of natural gas-fired steam boiler plants are old and inefficient and have low usage rates, averaging less than 10 percent in 2006.[6]

## *3. Will Retrofitting to Cooling Towers Jeopardize the Safety or Reliability of the Nuclear Plants?*

**No, a nuclear plant and several coal plants have already been cost-effectively and efficiently retrofit to closed-cycle wet cooling in the United States.**[7] Retrofitting to a wet tower is fundamentally simple - the pipes going to and from the ocean are rerouted to a cooling tower. No modification is required to the core components of the nuclear plant. Many U.S. nuclear plants use wet cooling towers already, and a number of these plants are capable of switching between wet cooling towers and once-through cooling.[8] Half-a-dozen U.S. power plants, both nuclear (Palisades Nuclear, 800 MW) and coal-fired, have been retrofit to wet towers, and more retrofits of large nuclear and coal power plants are planned. See photos of retrofit cooling towers at Palisades Nuclear and other selected sites in **Attachment 1**. The reliability of Diablo Canyon would actually be enhanced by converting to wet cooling towers. Diablo Canyon draws its cooling water from the Pacific Ocean, and during heavy storms both reactors are throttled back to 80% power to prevent kelp from entering the cooling water intake.[9] Throttling back to 80% power represents a reduction in power output of more than 400 MW at Diablo Canyon.

## *4. Will Retrofitting to Wet Towers Require Long Outages?*

**No, little or no unscheduled downtime has been necessary at those plants that have been retrofit.** At those nuclear and coal-fired plants that have been retrofit the hook-up of the new cooling system has generally been carried-out: 1) with little or no downtime beyond the typical annual maintenance outage period of 2-4 weeks, and 2) in non-summer months when power demand is low and this power demand can be comfortably met with a number of baseload plants, such as Diablo Canyon or SONGS, offline for maintenance and repair. The entire cooling tower and piping construction process can take place while reactors continuing to operate using once-through cooling. A shutdown is only required to allow final tie-in of the cooling tower piping to the existing surface condensers at each reactor. The April 2008 ICF Jones & Stokes reliability report prepared for the Ocean Protection Council states that properly scheduled conversion shutdowns, including those for nuclear plant conversions, should have no effect on overall grid reliability in the state.[10,11]

## *5. Are the Nuclear Plants Already Subject to Long Outages Periodically?*

**Yes, the outages at the two nuclear plants were each approximately 100 days long in 2004.** PG&E generally takes one of Diablo Canyon's units offline for refueling each year. Every three to five years, it takes both units offline. SCE takes from zero to two of SONGS' units offline each year. Diablo Canyon decreased from an average of 105 days per refueling outage in 1988 to 30 days per outage in 2002. However, the 2004 outage was 129.5 days. SONGS' decreased from an average 86 days per refueling outage from 1989 through 1993 to an average of 41 days per outage from 1999 to 2003. However, the 2004 outage at Unit 3 lasted 92 days and included repair work beyond refueling alone.[12]

**Good planning would dictate coordinating the cooling tower tie-in with a scheduled outage.** The most logical approach would be to coordinate the Diablo Canyon and SONGS cooling tower final tie-in with a scheduled refueling or maintenance outage, following the approach used for the steam boilers replacements at Diablo Canyon in 2008 and 2009 and at SONGS in 2009 and 2010.[13,14] The four steam generators at Diablo Canyon Unit 2 were replaced in 2008 with a total outage time of 69 days. The work was done concurrently with a planned refueling

outage.[15] Since the containment building and original installation of the steam generators was not intended to provide easy replacement, a completely customized system and innovative assembly process were needed to remove them. In contrast, the connection of cooling tower circulating water piping to the existing surface condensers associated with each nuclear reactor, the only phase of the cooling tower retrofit that would require shutdown of the reactor, would be a much less invasive project that replacing steam generators.

### *6. Is Space Available at Diablo Canyon and San Onofre for Cooling Towers?*

**Yes, cooling towers would require only a fraction of the available space.** A cooling tower for one reactor at Diablo Canyon or SONGS would require 3 to 5 acres of space, depending on the wet tower design.[16] Diablo Canyon is located on 903 acres, while San Onofre is located on 257 acres.[17] PG&E also manages an 11,000 acre conservation zone around Diablo Canyon. The February 2008 TetraTech report for OTC identified that feasible sites for cooling towers are available at both plants.[18] However, the site selected at Diablo Canyon would require relocation of a warehouse and other supporting structures that would result in a high demolition and building relocation expense. A superior site immediately adjacent to the reactor building on the north side of the site is undeveloped and would eliminate the high demolition/relocation expense. These two sites are shown in **Attachment 2**.

### *7. Will the Retrofits Cause a Drop in Nuclear Plant Efficiency?*

**Approximately 1 to 2%.** The overall energy penalty of a nuclear plant wet cooling tower retrofit is approximately 1 to 2%, not the unsubstantiated 10% as cited by SCE in its March 20, 2006 letter to SLC or 5% as stated by TetraTech in the February 2008 report prepared for the California Ocean Protection Council.[19] EPA cites a range of 1.2 to 1.5% total energy penalty depending on where the nuclear plant is located in the country.[20] These estimates are thoroughly substantiated with technical support documentation developed for the 316(b) regulatory process. The TetraTech estimates of cooling tower fan and circulating water pump energy penalty at Diablo Canyon and SONGS appear high by a factor of 1.5× to 2×. The turbine efficiency penalties calculated for the two nuclear plants by TetraTech are 10× the EPA estimate, insufficiently substantiated, and not credible.

### *8. How Much Would Air Emissions Increase if the Two Nuclear Plants Are Retrofitted to Wet Towers?*

**A very small to insignificant amount.** Output would be reduced about 1 to 2%, or 20 to 40 MW, as a result of the conversion to cooling towers. If this 20 to 40 MW is generated by a natural gas fired combined-cycle plant, the annual $NO_x$ and $PM_{10}$ emissions from this output would be about 9 tons/year (0.05 tons/day) and 5 tons/year (0.03 tons/day), respectively.[21,22,23] California is now aggressively developing renewable energy sources to meet state mandates. There would be no increase in air emissions if the power is replaced by renewable geothermal, solar, or wind resources.

### *9. Would a Retrofit Have Any Impact on the Nuclear Plants Ability to Comply with the New Greenhouse Gas Reduction Standards?*

**No, nuclear plants have no direct emissions of greenhouse gases and will fully comply with new GHG standards when retrofit to cooling towers.** The new legislation, AB 32 – *Global Warming Solutions Act*, was adopted in September 2006 and is intended to reduce California's dependence on inefficient coal- and natural gas-fired boiler plants for baseload electric power generation.

### *10. How Much Will It Cost to Retrofit the Two Nuclear Plants?*

**Approximately $100 to $250 million per reactor, less than the $300+ million per reactor that will be spent to replace the aging boilers at each nuclear plant.**[24] The cost to retrofit to closed-cycle cooling at the two nuclear plants will be significantly less than the steam generator replacement projects currently being carried-out at each plant. PG&E was authorized by the CPUC in 2005 to replace the aging steam generators at 2,160 MW Diablo Canyon at a cost of $700 million ($350 million per reactor). SCE was given approval for a similar steam generator replacement project at 2,200 MW SONGS for an estimated $680 million ($340 million per reactor).

### *11. Who Would Pay the Cost to Retrofit the Two Nuclear Plants?*

**The utility ratepayers of PG&E, SCE, and SDG&E**. PG&E, SCE, and SDG&E will pass on all costs associated with the cooling tower retrofits to utility ratepayers, and receive a fixed return on investment (profit), following approval by the CPUC.

### *12. How Will the Cost of the Retrofits Affect the Cost to Generate Power from the Nuclear Plants?*

**The wet cooling retrofits would have very little impact on the cost of power generation from the two nuclear plants, on the order of a 2% increase.** At a retrofit cost of $450 million per nuclear plant, the cost to generate power from the plants would increase approximately 2%. For example, the annualized cost of a cooling tower retrofit at Diablo Canyon, assuming a total retrofit cost of $450 million, would be about $43 million per year.[25] The gross power sales revenue for Diablo Canyon in 2006 was $2.3 billion.[26] A $43 million per expense is approximately 2% of gross annual revenues of $2.3 billion.

### *13. What Will Be the Source of Water for the Cooling Towers?*

**Recycled water is preferred for use in the wet towers.** SONGS can use treated wastewater currently discharged to the sea near the plant by nearby coastal cities as the cooling tower make-up water source.[27] Use of treated wastewater in cooling towers at SONGS would reduce water use at SONGS by 97% or more.[28] Where sufficient treated wastewater is unavailable, as is the case with Diablo Canyon, seawater is a viable option. Seawater is used in cooling towers at numerous large nuclear and conventional steam boiler plants in the United States. Use of seawater in closed-cycle cooling towers at Diablo Canyon would reduce seawater usage by approximately 96%.[29] Seawater is a somewhat less efficient cooling medium than treated wastewater. Seawater may also be used to augment treated wastewater supplies if these supplies are not sufficient to cover all of the make-up water demand.

### *14. Will the Cooling Towers Emit Visible Plumes?*

**Not cooling towers located in populated areas.** Wet towers can be equipped with plume abatement technology to minimize or eliminate vapor plumes. This is now standard practice in California for power plant cooling towers in urban areas. The February 2008 TetraTech study properly assumed that the cooling towers at SONGS would be equipped with plume-abatement technology as SONGS is located along a major interstate highway and near a city (San Clemente). In contrast, TetraTech assumed that the Diablo Canyon cooling towers would not be equipped with plume-abatement technology as the plant is located in a completely isolated location.

### *15. Will the Cooling Towers Emit Particulates?*

**Yes, some particulate (salt drift) emissions would be generated by the cooling tower.** Advanced "drift" eliminators are incorporated into cooling towers to minimize this water droplet carryover. An industry survey of operators of seawater cooling towers notes these operators have not reported any problems associated with salt drift at their facilities.[30]

### *16. How Are Other States and Regions Addressing Once-Through Cooled Nuclear Plants?*

**Other states and regions are aggressively pursuing nuclear plant wet tower retrofits.** The New York Department of Environmental Conservation (NYDEC) has recommended that the 2,000 MW Indian Point nuclear plant be retrofit to wet towers. NYDEC determined that a wet tower cost impact of less than 6 percent of revenue was not an unreasonable financial burden on the owner.[31] EPA has recommended that the 600 MW Oyster Bay nuclear plant be retrofit from once-through cooling to a wet cooling tower.[32]

**Attachment 1. Photos of inline cooling tower and round cooling tower options for retrofits at Diablo Canyon and SONGS**

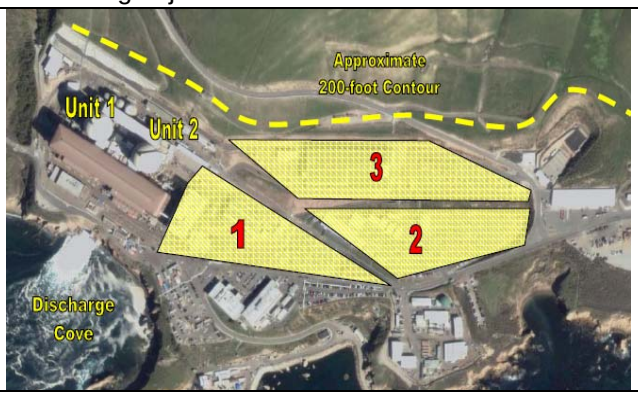
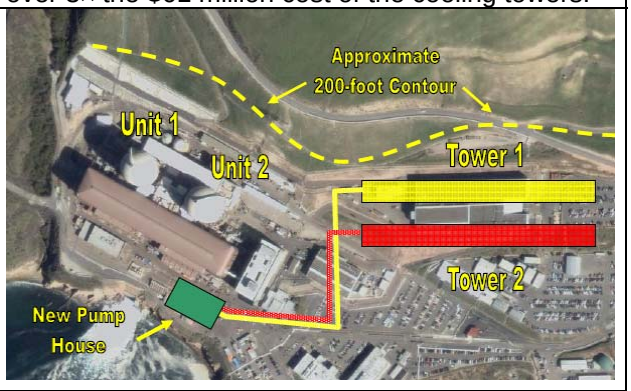
| | |
|---|---|
| **800 MW nuclear plant cooling tower retrofit**<br><br>$54 million: installed retrofit cost in 1999 dollars of 800 MW Palisades Nuclear (MI) conversion from once-through cooling to wet cooling towers.<br><br>$68/kW: Cost per KW installed (1999 dollars) |  |
| **Recent cooling tower retrofit of same size required for Diablo Canyon or SONGS reactor**<br><br>$87 million: 2004 installed retrofit cost of Plant Yates (GA) 40-cell wet cooling tower. Cost included remediation of onsite asbestos dump.<br><br>This 40-cell cooling tower design would provide approximates the cooling capacity necessary for one 1,100 MW reactor at Diablo Canyon or SONGS. |  |
| **1,300 MW nuclear reactor plume-abated round cooling tower**<br><br>500 ft. diameter, 160 ft. tall plume-abated round wet tower at GKN2 1,300 MW nuclear reactor (Germany), 1 billion gal/day cooling water flow. |  |
| **Possible locations for cooling towers at Diablo Canyon (left) and SONGS (right)** | |
|  |  |

**Attachment 2: Potential Cooling Tower Sites at Diablo Canyon Nuclear Plant**

The February 2008 report, "*California's Coastal Power Plants: Alternative Cooling System Analysis*," prepared by TetraTech for the California Ocean Protection Council, examined the cost and feasibility of cooling tower retrofits at coastal power plants currently using once-through cooling. TetraTech assumed that seawater would be used as the cooling medium, though the study also includes information on ocean outfall treated-wastewater flows near each plant.

In most instances the cooling tower siting and cost assumptions used by TetraTech are conservative and reasonable. However, in the specific case of Diablo Canyon Nuclear Plant, the selection of a difficult developed site by TetraTech for the cooling towers adds unnecessarily to the cost and downtime associated with the retrofit. Gently sloping, undeveloped land is located adjacent to the plant and was not considered by TetraTech. This land is archeologically significant. However, selection of this site for the cooling towers would eliminate most/all of the negative cost and plant reliability issues raised by the site identified by TetraTech. This undeveloped site (top two photos) and the sites proposed by TetraTech (bottom two photos) are shown in the series of photos in **Figure 1**.

**Figure 1. Candidate sites for retrofit cooling towers at Diablo Canyon Nuclear Plant**

| | |
|---|---|
| Diablo Canyon – Photo looking south across undeveloped land. Note this site adjacent to the plant is relatively flat. No demolition cost would be incurred, and little grading would be necessary. | Sites recommended by Powers Engineering as preferred for cooling towers is identified by red rectangles. Advantages – undeveloped, reasonably flat, adjacent to reactor building. |
|  |  |
| 2008 TetraTech study commissioned by California OPC looked only at developed land adjacent to plant as possible sites for cooling towers. Three areas were examined. Study provided no specific reason for not considering adjacent land to north. | 2008 study recommended Area 3 for cooling towers, if space to relocate main warehouse and other affected buildings could be found. This site would incur over $200 million in demolition costs, over 3× the $61 million cost of the cooling towers. |
|  |  |

[1] CEC, *Issues And Environmental Impacts Associated with Once-Through Cooling at California's Coastal Power Plants*, CEC-700-2005-013, June 2005, p. 12, Figure 1.

[2] Ibid. Figure 1 indicates an OTC coastal steam plant uses approximately 750 million gallons per day (Mgd) per 1,000 MW of capacity.

[3] CEC comment letter to SLC dated April 12, 2006, p. 3. Conventional steam boiler capacity factor in 2004 was 0.194. Nuclear plant capacity factor in 2004 was 0.791.

[4] Two nuclear plants' OTC usage in 2004: 2 x 2.5 billion gallons/day x 365 day/year x 0.791 = 1,444 billion gallons/yr. Coastal steam boiler OTC usage in 2004: 14,000 MW x 750 Mgd/1,000 MW x 365 day/year x 0.194 = 746 billion gallons/yr. Total OTC use was 2,190 billion gallons/yr. Nuclear component was 1,444/2,190 = 66% of total OTC use.

[5] ICF Jones & Stokes, *Electric Grid Reliability Impacts from Regulation of Once-Through Cooling in California*, prepared for California Ocean Protection Council, April 2008, Table 3-1, p. 19.

[6] Ibid.

[7] Retrofitting to a wet tower is fundamentally simple - the OTC pipes going to and from the ocean are rerouted to a cooling tower. At facilities that have been retrofit, the hook-up of the new cooling system has generally been carried-out without requiring an extended unscheduled outage. The cost to retrofit 800 MW Palisades Nuclear (MI) to wet towers was $68/kW (1999 dollars). The cost to retrofit 750 MW Pittsburg Unit 7 (CA) was $46/kW (1999 dollars) [ref: EPA 316(b) Phase II Technical Development Document, Chapter 4].

[8] Prairie Island Nuclear (MN) and Vermont Yankee (VT) are two examples of nuclear plants designed to operate in closed-cycle with cooling towers or in open cycle with once-through cooling.

[9] http://en.wikipedia.org/wiki/Diablo_Canyon_Power_Plant, December 2006.

[10] ICF Jones & Stokes, *Electric Grid Reliability Impacts from Regulation of Once-Through Cooling in California*, prepared for California Ocean Protection Council, April 2008, p. 34.

[11] The February 2008 TetraTech report assertion that cooling tower retrofits at Diablo Canyon and SONGS would necessitate 8 months of plant outage at each site is unsubstantiated in the text and not credible based on outage times for cooling tower retrofits at operating power plants documented by the EPA in the 316(b) process.

[12] CEC, *Nuclear Power in California: Status Report*, CEC-150-2006-001-F, March 2006, pp. 67-68.

[13] 2,100 MW Diablo Canyon was recently authorized by the CPUC to replacing aging steam generators at a cost of $700 million [ref: California Energy Circuit, *CPUC Approves $706 million for Diablo Canyon*, February 25, 2005, p. 1]. A steam turbine replacement project authorized by the CPUC for 2,100 MW San Onofre is estimated to cost $680 million [ref: CPUC San Onofre Steam Generator Replacement Proceeding, Decision 05-12-040 December 15, 2005] These steam generator retrofits will cost in the range of $300/kw to $330/kw, much higher than the probable cost to retrofit these plants to wet towers.

[14] CEC, *Nuclear Power in California: Status Report*, CEC-150-2006-001-F, March 2006, pp. 45-46.

[15] Power Engineering, *Project-of-the-year award winners*, January 2009. See: http://pepei.pennnet.com/articles/print_toc.cfm?Section=ARTCL&p=6

[16] A 40-cell side-by-side inline wet tower would measure 1,024 ft. by 108 ft., or 2.5 acres. A 500-foot diameter round tower would cover 4.5 acres.

[17] San Onofre has two reactors and sits on a 257 acre site [ref: Utilities Service Alliance, San Onofre webpage: http://www.usainc.org/sanonofre.asp]. Diablo Canyon sits on a 903 acre site [ref: http://en.wikipedia.org/wiki/Diablo_Canyon_Power_Plant]

[18] The cooling tower for each 1,100 MW reactor would require from 3 to 5 acres of land, depending on whether an inline or round cooling tower is used. Inline wet cooling towers can provide 500 to 600 MW of steam plant cooling per acre (210 feet by 210 feet area) [ref: B. Powers, direct and rebuttal testimony, Danskammer Power Station draft permit proceeding – SPDES NY-0006262, October 2005 and December 2005. Testimony describes design basis for retrofit plume-abated tower measuring 50 feet by 300 feet for 235 MW of steam plant capacity.] Only 2 to 4% of the San Onofre site would be needed for the towers.

[19] EPA 316(b) Phase II Technical Development Document, Chapter 5, Sections 5.6.1 through 5.6.3, p. 5-34. The measured annual efficiency penalty at 346 MW Jeffries Station is 0.16%. The cooling tower pump and fan energy demand for steam plants is estimated by EPA at 0.73%. Total energy penalty for Jeffries Stations would be approximately 0.9%. EPA also estimates the overall energy penalty for Catawba and McGuire nuclear plants at 1.7%, and for the Palisades nuclear plant at 1.8%. The generic annual efficiency penalty calculated by EPA (Table 5-10) for nuclear plants operating at 100% load is 0.4%. The generic nuclear plant cooling tower pump and fan energy demand is estimated by EPA (Table 5-16) at 0.9%. The total generic energy penalty for nuclear plants operating at 100% load is estimated by EPA at 1.3%. EPA shows a mean annual nuclear plant energy penalty of 1.7% in Table 5-1. However, when nuclear plants are operational they generally operate at 100% load.

[20] EPA 316(b) Phase II Technical Development Document, Chapter 5, Table 5-1, p. 5-2. National average total energy penalty of wet cooling tower versus once-through cooled nuclear plant is 1.7%. The fan and pump energy penalty of the wet tower is 0.92% greater than OTC (Table 5-15, p. 5-33). The highest annual turbine efficiency penalty shown for a nuclear conversion to wet cooling tower is 0.52% (for Jacksonville, FL, Table 5-10, p. 5-21), the lowest is Seattle, WA (0.29%).

[21] CARB, Guidance for the Permitting of Electric Generation Technologies, Stationary Source Division, July 2002, p. 9 ($NO_x$ emission factor = 0.07 lb/M-hr combined-cycle plants)

[22] San Diego County Air Pollution Control District (APCD), Otay Mesa Power Project (air-cooled), Authority To Construct 973881, 18 lb/hr particulate without duct firing (510 MW output), equals ~ 0.04 lb/MW-hr.

[23] San Onofre is located in San Diego County. The $NO_x$ and $PM_{10}$ emissions offset thresholds defined by San Diego County APCD Rule 20.1 ("New Source Review General Provisions") are 50 tons/year for $NO_x$ and 100 tpy for $PM_{10}$. Diablo Canyon is located in San Luis Obispo County. The $NO_x$ and $PM_{10}$ emissions offset thresholds defined by San Luis Obispo APCD Rule 204 ("Requirements") are 25 tons/year for $NO_x$ and 25 tpy for $PM_{10}$.

[24] A large capital investment like a wet tower retrofit would be amortized over 20 to 30 years. CCEEB estimates the cost to retrofit 20,700 MW of coastal power plant capacity with wet towers at $2 billion, or $100 million per 1,000 MW of capacity. The capacity at SONGS and Diablo Canyon is approximately 2,100 MW each. Using the CCEEB figure, a wet tower retrofits at the two nuclear plans would cost on the order of $210 million each. TetraTech (February 2008) estimates a cooling tower retrofit cost of nearly $900 million at Diablo Canyon. However, this very high cost at Diablo Canyon appears to be a result of poor site selection for the cooling tower retrofit and an excessive contingency budget (30%) on top of an already conservative cost estimate. A more realistic cost estimate is one-half ($450 million) or less. The SONGS retrofit cost estimate is lower at $593 million, but also suffers from an excessive contingency added on top of an already conservative estimate. Removing the contingency and instead identifying the cost estimate as preliminary estimate with an accuracy of $\pm$ 30% would result in a adjusted cost estimate of approximately $450 million.

[25] Assuming 20-year, 7% interest project financing used in TetraTech February 2008 to determine the annual cost of cooling tower retrofits at California once-through cooled coastal power plants.

[26] TetraTech, *California's Coastal Power Plants: Alternative Cooling System Analysis*, prepared for California Ocean Protection Council, February 2008, Chapter 7, Section C, Table C-23, p. C-31.

[27] Approximately 50 Mgd of high quality treated wastewater is currently being discharged through ocean outfalls within 15 miles of SONGS and is potentially available as cooling tower make-up water at SONGS. This water would require at a minimum in-line chlorine disinfection and some additional filtration before use in a cooling tower. Cooling towers at SONGS would require approximately 45-50 Mgd of make-up water. The equipment cost for 50 Mgd of in-

line chlorination treatment capacity is approximately $2-3 million, and O&M cost approximately $0.5 million/year, based on 2005 cost data from an Orange County Sanitation District study of disinfection options for 240 Mgd of treated wastewater discharged to the ocean. Estimates of available treated wastewater from nearby ocean outfalls are (from February 2008 TetraTech report, Chapter 7, Section N, p. N-21):

| | |
|---|---|
| Oceanside (15 miles away): | 27 Mgd |
| SOCWA (10 miles away): | 19 Mgd |
| San Clemente (6 miles away): | 4 Mgd |

An offshore pipeline interconnecting these ocean outfalls to the SONGS cooling intake pipe would simplify delivery of this make-up water. The February 2008 TetraTech study estimates an installed cost of $3.2 million per mile for the cooling tower make-up water pipe (Chapter 7,

[28] TetraTech, *California's Coastal Power Plants: Alternative Cooling System Analysis*, prepared for California Ocean Protection Council, February 2008, Chapter 4, p. 4-3.

[29] Ibid, Chapter 7, p. C-1.

[30] Dr. Shahriar Eftekharzadeh – Bechtel, *Feasibility of Seawater Cooling Towers for Large-Scale Petrochemical Development*, Cooling Technology Institute Journal, Summer 2003, Vol. 24 No. 2, pp. 50-64. Operators of seawater cooling towers have not reported any problems associated with salt drift at their facilities. Site inspections of two long-time saltwater cooling tower installations did not exhibit any visible signs of salts fallout.

[31] New York Department of Environmental Conservation, *Fact Sheet - New York State Pollutant Discharge Elimination System (SPDES) Draft Permit Renewal With Modification,* Indian Point Electric Generating Station, Buchanan, NY - November 2003.

[32] J. Filippelli - EPA Region 2, comment letter to Nuclear Regulatory Commission on draft EIS for Oyster Bay Nuclear relicensing, September 7, 2006.